

UNITED STATES DEPARTMENT OF THE INTERIOR
FISH AND WILDLIFE SERVICE

SECOND REVISED DRAFT

FISH AND WILDLIFE COORDINATION ACT REPORT
FOR THE

MAGPIE CREEK FLOOD CONTROL PROJECT
SACRAMENTO COUNTY, CALIFORNIA

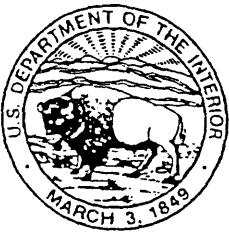
prepared by

U.S. FISH AND WILDLIFE SERVICE
HABITAT CONSERVATION DIVISION
SACRAMENTO FISH AND WILDLIFE OFFICE
SACRAMENTO, CALIFORNIA

prepared for

U.S. ARMY CORPS OF ENGINEERS
SACRAMENTO DISTRICT
SACRAMENTO, CALIFORNIA

May 2003



United States Department of the Interior

FISH AND WILDLIFE SERVICE
Sacramento Fish and Wildlife Office
2800 Cottage Way, Room W-2605
Sacramento, California 95825-1846

REPLY TO ATTENTION TO
CESAC - Magpie Creek FCP

MAY 8 2003

Kenneth Hitch
Chief, Planning Division
Corps of Engineers, Sacramento District
1325 J Street
Sacramento, California 95814-2922

Dear Mr. Hitch:

Please find enclosed our second revised draft Fish and Wildlife Coordination Act report for the Magpie Creek Flood Control Project. The report has been modified to reflect a new alternative involving reduced work, namely, raising a portion of the Magpie Creek Diversion Channel levee, building a short section of new levee along Raley Boulevard to prevent outflanking flows, purchase and preservation of 80 acres of lands generally between Magpie and Don Julio Creeks to detain peak flows during major flood events, a new maintenance road, and a new culvert under the bike trail at Robla Creek. No channel widening is proposed in this design.

By copy of this letter, we ask that the California Department of Fish and Game issue comments or otherwise indicate their concurrence with the findings in this report, by May 30, 2003.

If you have any questions, please contact Dr. Steven Schoenberg of my staff at (916) 414-6564.

Sincerely,

David L. Harlow
Acting Field Supervisor

Enclosure

cc:

AES, Portland, OR
American River Flood Control District, Sacramento, CA (Attention: Paul Devereux)
CDFG, Region II, Rancho Cordova, CA
COE, Sacramento, CA (Attention: Becky Wren)
EDAW, Sacramento, CA (Attention: Debra Bishop)
SAFCA, Sacramento, CA (Attention: Grant Kreinberg)

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SUMMARY

The Magpie Creek Flood Control Project would provide 170-year flood protection to part of the historic Magpie Creek floodplain in north Sacramento County. The project involves raising the Magpie Creek Diversion Channel levee between Raley Boulevard and Vinci Street, constructing a short section of levee on the west side of Raley Boulevard just south of the diversion channel, purchase and preservation of about 80 acres of floodplain lands between and adjacent to Don Julio and Magpie Creeks that would function to detain flood flows, constructing a new culvert and channel under the bike trail bridge at the Robla Creek confluence with the diversion channel, and constructing a landside or top-of-bank maintenance road between Raley Boulevard and Dry Creek Road. The project would have no direct impacts on marsh, scrub-shrub, open water, and seasonal wetland (including vernal pool) habitats. Project construction would disturb less than 3 acres of upland/herbaceous cover, of which about 0.7 acre would be lost at the expense of the proposed maintenance road. Potential indirect impacts are: a) preventing outflanking flows from reaching 0.25 acre of seasonal/wetland swale; for which 0.5 acre would be purchased in an approved preservation bank; b) constructing a culvert within the dripline of up to eight trees (six oaks, two black locusts); c) small increases in inundation depth (less than 0.5 feet) and duration (less than 2 hours) in the purchased floodplain; and d) modest growth-inducing impacts on habitats in the protected floodplain.

We find that the project maximally avoids most impacts to fish and wildlife resources, provides substantial protection to existing resources at risk of loss through conjunctive use of the purchased land for flood control and preservation, and provides other opportunities through enhancement of the preservation area or historic Magpie Creek corridor. We conclude that: a) the proposed preservation bank purchase adequately compensates indirect impacts to seasonal wetlands; b) hydraulic effects on the preservation area are insignificant and do not require mitigation; c) growth-inducing effects could be minimized by informing landowners of the existing community plan amendment regarding Magpie Creek, presence of wetlands in the floodplain, and appropriate permitting procedures; and d) indirect or direct effects on trees due to culvert construction are significant and should be mitigated by replanting at ratios of 5:1 for each oak tree impacted but not removed, 15:1 for each oak tree removed, and 3:1 for other trees removed - mitigation plantings may be accomplished in the preservation area, along the bike trail, or another area acceptable to the Corps of Engineers, Fish and Wildlife Service, and local sponsor. We have identified culvert modifications or options to the culvert to maximally avoid tree impacts. We have also identified and recommended further enhancement actions along Don Julio and historic Magpie Creeks, and in the preservation area.

INTRODUCTION

This document is the Fish and Wildlife Service's (Service) detailed report on the Corps of Engineers' (Corps) Magpie Creek Flood Control Project. It has been prepared under the authority of section 2(b) of the Fish and Wildlife Coordination Act (FWCA, 48 stat. 401 as amended; 16 USC 661 et seq.). This report evaluates a new design for flood control accomplished through levee improvements in which peak flows from Magpie and Don Julio Creeks are detained on existing undeveloped lands that would be purchased and preserved in perpetuity; no channel improvement would be done. As such, this report supercedes our previous final report (FWS 1996a), and revised draft report (FWS 2001) for designs based on channel widening approaches.

The purpose of the project is to provide 170 years of flood protection to a portion of the historic Magpie Creek floodplain, located in north Sacramento County¹. This area is already drained by an existing flood control facility, the Magpie Creek Diversion Channel (MCDC), however the level of flood protection is considered inadequate. Elevated flood risk has resulted from increased peak runoff due to impervious urban surfaces in the upslope watershed (streets, parking lots, buildings), constructed at the expense of natural lands better capable of absorbing or retaining runoff (JSA 1989). Nolte (1994) estimates the current capacity to be as low as 800 cubic feet per second (cfs) for the MCDC immediately downstream of Raley Boulevard to Vinci Avenue and as low as 250 cfs for Magpie Creek upstream of Raley Boulevard. These capacities are well below the peak 100-year flows at Raley Boulevard for either Don Julio (1,670 cfs) or Magpie Creek (950 cfs, *see* Corps 1995). Under existing conditions, excess flows from the 14-year or larger event overtop Raley Boulevard and flood lands east of the MCDC by outflanking and/or overtopping the MCDC levee, discharging into historic Magpie Creek and its floodplain (Ford 2001). With the project, floodwaters would be detained in a preservation area east of Raley Boulevard, levee improvements would prevent outflanking and overtopping flows from reaching the historic Magpie Creek floodplain, and the design flow would be contained within the MCDC.

PREVIOUS COORDINATION

The Service issued detailed analyses of two earlier flood control project designs for the project area (FWS 1996a, 2001). Each included a detailed account of the biological resources, including listed species, the impacts of the flood control project, a quantitative analysis of project impacts and mitigation needs (using Habitat Evaluation Procedures, or HEP), and other recommendations for avoidance and minimization of impacts. Our 1996 report compared a detention basin and a channel widening design, with work to be conducted from Patrol Road in McClellan Business Park (MBP, formerly known as McClellan Air Force Base) to Robla Creek. We identified needs to mitigate direct and indirect habitat impacts which would have resulted from construction, hydrologic changes, and/or habitat losses through induced development of the protected

¹Please note that Corps documents refer to flood protection level in terms of the true exceedence probability of overtopping a structure at a specified reference point which, for this project, is the top of the MCDC levee at Station 66+00. For example, an exceedence probability of 0.005 is interpreted as a 1 in 200 chance of flooding in any given year, and is referred to elsewhere as "200-year flood protection."

floodplain. Subsequent to closure of the air force base, we evaluated a channel widening plan that was reduced in extent, spanning from about Raley Boulevard to Robla Creek, and oversized to allow reduced maintenance and more vegetation (FWS 2001). These revisions reduced, but did not eliminate, the area and net habitat value losses of some habitat types such as riparian scrub-shrub and seasonal wetland.

In an effort to further minimize project impacts and mitigation, the local sponsor (Sacramento Area Flood Control Agency, SAFCA) commissioned additional hydraulic modeling and preliminary new designs (Ford 2001). Ford's alternative 3 attempts to avoid all direct habitat impacts by detaining peak floods in undeveloped lands which would be purchased and preserved, and is the subject of this report. The Service attended several informal meetings to discuss the potential acceptability at the concept stage. In 2002, SAFCA published an Initial Study/Proposed Negative Declaration on a preliminary project design based on Ford's alternative 3 (EDAW 2002a) as well as responses to comments (EDAW 2002b). The Corps slightly modified this alternative by substituting a levee raise for the floodwall component. Our analysis is based on materials reviewed in previous reports, and additional materials provided by Corps personal communication, as follows: a narrative project description dated December 10, 2002; construction drawings dated December 12, 2002 (received March 14, 2003); and personal communication with Corps staff on specific assumptions (e-mail dated April 1, 2003 from Becky Wren, Corps of Engineers, Sacramento District).

PROJECT AREA

The project area is located within the city limits of Sacramento, north of Interstate Highway 80 (I-80) and between the west boundary fence of MBP to the east and Rose Street to the west. The eastern part of the area is traversed by two west-flowing creeks, Magpie Creek and Don Julio Creek, which drain lands east of Raley Boulevard into the MCDC. The project area includes an ~80 acre floodplain situated west of the MBP boundary and east of the portion of the MCDC parallel to Raley Boulevard, sections of both Magpie and Don Julio Creeks, levees and easements along the MCDC between Raley Boulevard and Dry Creek Road, lands bordering the west side of Raley Boulevard south of the MCDC to Santa Ana Avenue, and lands near the bike trail at the Robla Creek confluence with the MCDC (Figure 1). Other parts of the floodplain outside this defined area could also be affected by the project, including (Figure 2): a) broader areas following the alignment of historic Magpie Creek from Raley to Rio Linda Boulevard; b) a more confined floodplain between Main and Bell Avenues, also along historic Magpie Creek; c) a small area north of the MCDC near Robla Creek; and d) a large area on both sides of I-80 between Norwood Avenue and the Natomas East Main Drainage Canal (NEMDC) levee.

Magpie and Don Julio Creeks are intermittent streams originating east of MBP and north of I-80, and draining a combined watershed of about 6,460 acres. The watershed topography varies from gently rolling hills with well-drained soils underlain by cemented hardpan to nearly level areas at the lowest elevations. The cemented substratum occurs at a variable depth of 20 to 60 inches. Perched groundwater is present at a depth of 5 to 8 feet around MBP, and the creeks discharge into a permanent aquifer at about -40 feet mean sea level. Average precipitation is about 18 inches per year, but the project area is prone to flooding caused by intense imbedded cells within

Construct new maintenance road
(top of bank, Vinci to Dry Creek Rd)

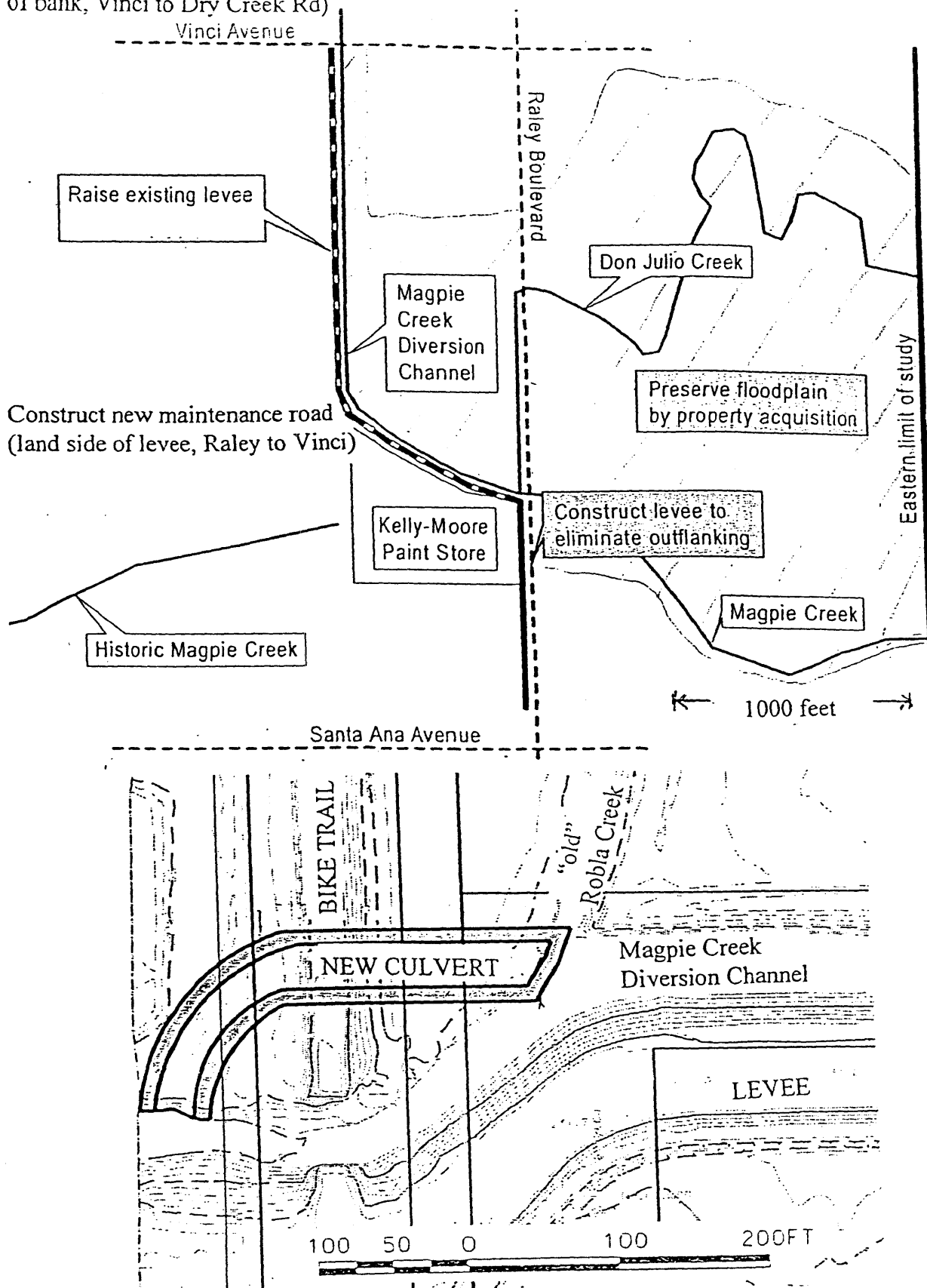


Figure 1. Proposed elements for the Magpie Creek Flood Control Project. Alignment of new maintenance road between Vinci and Dry Creek Road not shown. Adapted from EDAW (2002) and construction plans dated December 12, 2002. (Corps of Engineers, Sacramento District).

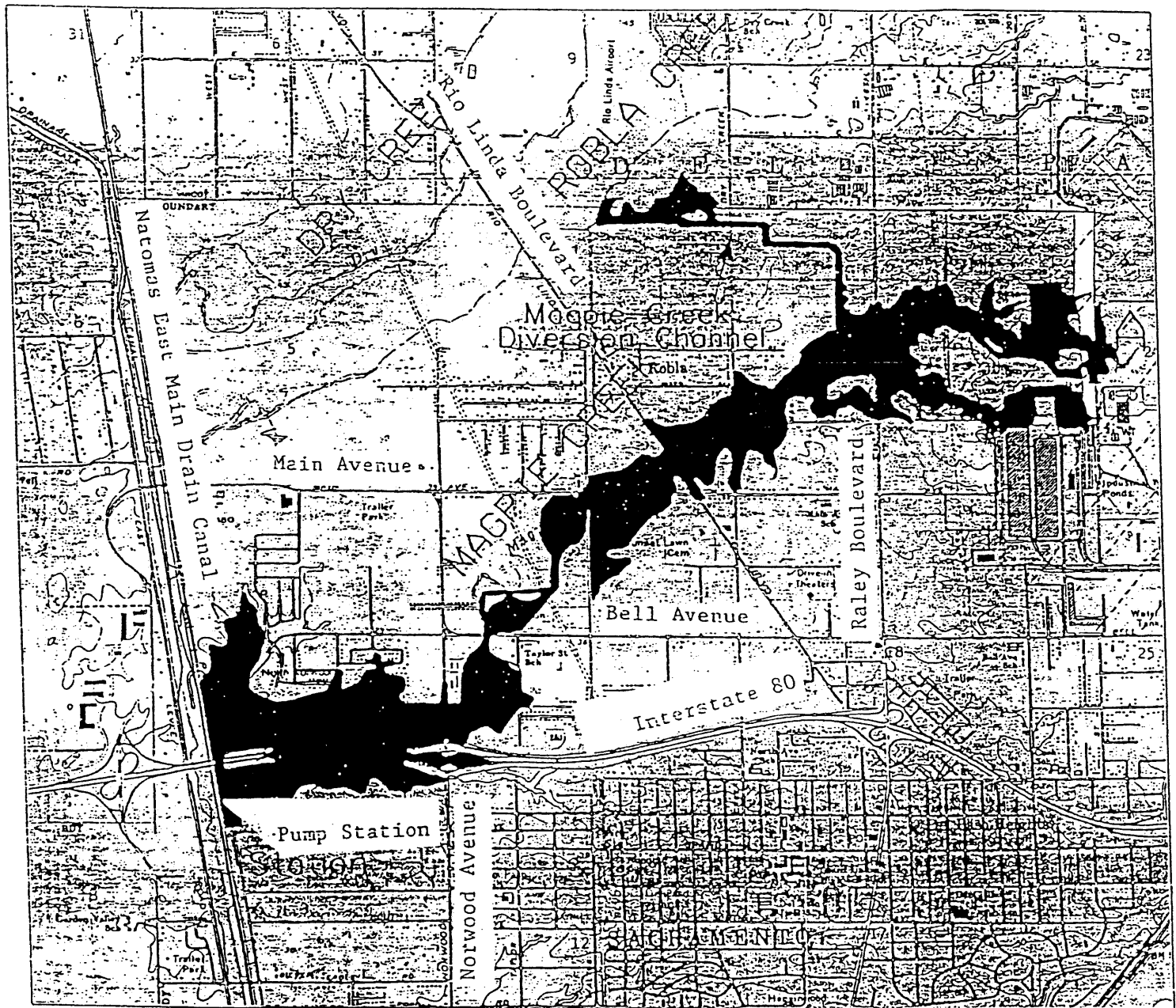


Figure 2. Map showing the 500-year floodplain of Magpie and Don Julio Creeks which would obtain flood protection due to construction of the proposed Magpie Creek Flood Control Project (from Corps 1995).

general rain storms over the area. Other than precipitation, the creeks also receive treated groundwater discharge from an ongoing operation to remediate contaminated groundwater under MBP, and limit the spread of contaminants within the aquifer.

Built in 1955-1956, the MCDC is a artificial earth channel which diverts Magpie Creek flows from the historic channel north and west to Robla Creek, eventually emptying into the NEMDC. The term "historic" Magpie Creek refers to an old channel which begins west of the MCDC near Raley Boulevard from behind the Kelly-Moore paint store, and continues southwest to I-80 at Norwood Avenue, where it then follows the freeway to the NEMDC in a concrete-lined trapezoidal channel. Historic Magpie Creek receives most of its flow from local runoff within its interior watershed. Flooding in the area north and east of the MCDC (including Raley Boulevard and lands east along Magpie and Don Julio Creeks) occurs on the order of every other year or so, overtopping the levee at around the 14-year event (EDAW 2002a). Some perennially standing water or wet ground is present in portions of the historic channel, although it does not typically exhibit a flow except during storm events.

The eastern portion of the watershed is residential with commercial development along major thoroughfares like Watt Avenue. Land use within much of MBP is comparable to light industry, with paved surfaces, but the eastern portion has some unpaved areas left as clearance or security buffers around runways and other former base facilities. Within MBP and the adjoining community of North Highlands, prior flood control projects have completely channelized and/or lined much of the creeks. The western portion of the Magpie Creek watershed is less intensively developed, with areas of low- to moderate-density residences interspersed among larger tracts of grazed or ungrazed pasture, as well as a small strawberry farm. Except for housing developments around North Norwood Park and businesses on Pell Drive, the limits of development closely match contours of the 500-year floodplain map (Figure 2, the 170-year floodplain is similar in area, with a shallower flood depth). The designated land use zones for undeveloped areas within the historic Magpie Creek floodplain are light industry east of Dry Creek Road, and residential west of Dry Creek Road.

PROPOSED PROJECT

The proposed project is based on a new watershed model and flood control concept developed by David Ford Consulting (Ford 2001). Ford's Alternative 3 assumes elimination of flows which either overtop the MCDC or outflank (flow around) the upstream end of the levee at Raley Boulevard, and is the subject of evaluation in this report.

Currently, the left bank levee of the MCDC could overtop at about the 14-year event. Therefore, the MCDC levee would be raised up to 4 feet, for a distance of 2,100 feet beginning at Raley Boulevard and tapering to existing ground just south of Vinci Avenue. To prevent flood waters from outflanking the MCDC levee to the south at Raley Boulevard, a new levee would be constructed along the west side of the boulevard from the Magpie Creek bridge south for a distance of about 1,000 feet. The levee would be a maximum of 5 feet high at the MCDC, tapering to existing ground. The existing access to Kelly-Moore's paint store would be rebuilt in a fashion to be decided later (ramp/road over levee, relocate south, or floodwall/gate section).

A new, 12-foot-wide maintenance road would be constructed from Raley Boulevard to Dry Creek Road on the left bank, looking downstream; between Raley and Vinci, the road would be landside of the toe of the improved levee, and between Vinci and Dry Creek Road it would be located at the top of slope of the MCDC. This road is in addition to the maintenance road on top of the existing levee. A new 30-foot-wide by 5-foot-high culvert would be installed about 40 feet north of the bicycle path overcrossing near the Robla Creek/MCDC confluence. A channel would be excavated to carry excess flows to the culvert and back into Robla Creek, but the invert of the channel and culvert would be set 1 foot above the invert of the MCDC so that low flows would continue to be carried under the bridge into Robla Creek. The purpose of the culvert is to preclude any increase in the water surface at Dry Creek Road during a flood event.

The project would cause an area between the MCDC just west of Raley and the western boundary of the MBP to experience a slight increase in flood depth and duration during all events greater than the 5-year frequency of occurrence. At most, during a 250-year event, the increase in water surface would be 0.7 feet at Raley Boulevard and 0.2 feet at the western project boundary, and the increase in duration of flooding would be 1-2 hours (Figure 7 in Ford 2001). The area of inundation would increase by 5 acres, to a total of 80 acres. The project sponsor would purchase and preserve in perpetuity the entire 80 acres as floodplain. Although flood depth and duration would also increase within the MCDC, no additional area is affected.

Project construction would take one season, and occur between May 1 and October 1. Staging would occur on a section of Vinci Avenue just west of the MCDC, and borrow material would be obtained from material recently stockpiled at a site near the northwest corner of Dry Creek Road and the MCDC. Construction periods for the levee, culvert, and maintenance road elements are estimated at 60, 45, and 21 days, respectively.

The sponsor has developed a Mitigation Monitoring Program (MMP) that includes the following avoidance and minimization measures:

- *Vernal Pool Crustaceans* - a) completion of ESA section 7 consultation, and b) acquisition of 0.5 mitigation credits from a Service-approved mitigation bank;
- *Giant Garter Snake (GGS)* - a) activities within 200 feet of aquatic habitat to be conducted between May 1 and October 1, b) worker awareness training in GGS identification, habitat, status, and impact avoidance measures, c) limit heavy equipment to roads and levees, and d) notification of Service and halting construction upon siting of GGS until avoidance measures are developed;
- *Swainson's Hawk* - For proposed work within February 1-August 31 nesting season: a) survey within 0.5 mile of work sites prior to construction, and b) delaying work until young of year show nest independence;
- *Burrowing Owl* - a) within 14-30 days of construction and 350 feet from work sites, survey for suitable habitat and occupied burrows, b) (before nesting) avoidance until owls have been removed/relocated using Department of Fish and Game-approved passive

exclusion methods, and c) (during February 1-August 31 nesting season) verification that birds have not laid eggs or juveniles show nest independence;

- *Other Raptors* - Same as for Swainson's Hawk, except 500 feet from work sites;
- *Wetlands* - As part of a Nationwide permit application, submit to the Corps, a mitigation plan for indirect impacts to 0.25 acre of wetland that would ensure no net wetland loss;
- *Oak Trees* - Fencing 5 feet outside of dripline, or obtain City of Sacramento permit under Section 19.12.160 of the Tree Preservation Ordinance, and fence within dripline.

BIOLOGICAL RESOURCES

Vegetation - The project area was previously cover-typed by ESA (1993) into upland, riparian scrub-shrub, freshwater emergent marsh, seasonal wetlands (all types, including vernal pools), and open/poorly vegetated waters. Some revisions in the total area and distribution of cover-types were made as a result of the Service's review of all sources, including the ESA report as well as aerial photography, wetland delineations, and a number of field visits during which the habitat conditions were documented by ground photography of the entire project length (most recently January 4-5 and March 17, 2000, and March 31-April 1, 2003). However, the reduced construction footprint of the current project version confines direct impacts to grassland and bare ground (i.e., levee road, staging and borrow areas). Where appropriate, we have noted the presence of cover-types in the construction footprint and preservation area.

Upland/herbaceous grassland comprises the majority of the project area, in both the preservation and construction areas; the maintenance road, the levee, and the channel connecting the MCDC with the proposed culvert under the bicycle bridge are all predominantly grassland. Grassland is also present in sections of creek or diversion channel banks lacking woody vegetation, and in the preservation area footprint, including most of the former rice field area east of Raley Boulevard between Don Julio and Magpie Creeks. Upland cover is relatively abundant in the project area though sometimes interspersed with seasonal wetlands of several types. Dominant species are non-natives such as wild oat, field mustard, goat grass, bromes, and especially star thistle. Native species include several brodiaeas, milkweed, bumweed, tarweed, and lotus. Light tilling is sometimes done in portions of the project area every few years as a fire control measure.

Riparian scrub-shrub occurs within or near the permanent and intermittent stream channels of Magpie Creek, Don Julio Creek and the MCDC. Defined as woody vegetation less than 20 feet tall, the dominant species are various willows, box elder, cottonwood, black walnut, black locust, and alder, with a few Oregon ash and silver maple, and patches of Himalayan blackberry. Riparian scrub-shrub cover-type occurs as either isolated trees spaced 100 feet or more apart, sparse patches with a few trees 10 to 30 feet apart (e.g., MCDC downstream of Dry Creek Road, and Magpie Creek east of Raley Boulevard), or dense thickets with trees less than 3 feet apart (e.g., MCDC between the Dry Creek Road and Vinci Avenue crossings, Magpie Creek between Lang Avenue and the MBP boundary, historic Magpie Creek near Dry Creek Road, and Don

Julio Creek from Patrol Road to 1,000 feet west of the MBP boundary). No scrub-shrub appears that it would be directly or indirectly impacted by the project.

Riparian forest exists in the form of a small number of large isolated valley oaks, willows, cottonwoods, and black locust trees in excess of 20 feet in height. These are scattered throughout the project area, generally outside the active channel of the creeks or MCDC. Several cottonwoods appear to have been killed by recent beaver activity. Up to six oak and two black locust trees appear to be in or near enough to the footprint of the proposed bike trail culvert to be potentially impacted.

Freshwater emergent marsh is also found within parts of all of the channels, and consists primarily of cattail and bulrush. This cover-type occurs in much of Don Julio Creek, portions of historic Magpie Creek, and especially the MCDC. It is defined by the presence of perennial ponding and/or saturated soils and associated obligate wetland vegetation. None would be affected by the project.

Seasonal wetlands include several natural hardpan vernal pools, and other areas (termed "rice-check vernal pools," "rice-check seasonal wetland," "seasonal wetland/swale," and "floodplain wetland," *see* ESA 1993) which may or may not have a hardpan, but which form standing water and provide similar biological functions and values as the natural vernal pools. Some of these wetlands may be seen adjacent to individual rice checks, conforming to the shape of the berms; ponding in these areas apparently results from local perching of the groundwater east of Raley Boulevard. Such "rice-check vernal pools" or "rice-check seasonal wetlands" are floristically similar to the true hardpan vernal pools delineated in the same area; dominant species in these seasonal wetlands are umbrella sedge, spikerush, turkey mullein, coyote thistle, tarweeds, Mediterranean barley, rush, and others. "Seasonal wetland/swale" has been identified by ESA (1994a) as a wetland not associated specifically with rice-checks, although possessing similar species as the rice-check wetlands. Another type of seasonal wetland located adjacent to the MCDC and the creeks, termed "floodplain wetland," refers to areas which become temporarily flooded due to overbanking of the creeks during heavy rains. Several acres of these various wetlands occur in the low-lying portions of the preservation area east of Raley Boulevard, especially between Magpie and Don Julio Creeks. No wetlands occur in the construction footprint, but about 0.25 acre was identified in the historic Magpie Creek area, which may be affected by elimination of outflanking flows (EDAW 2002a).

Fish and Wildlife - The types and diversity of animal resources vary among the cover-types, and have been documented in several previous studies in and around the project area (EPA 1993, ESA 1994a, JSA 1989, EDAW 2002a). In the upland/herbaceous grasslands, mammals such as California vole and black-tailed jackrabbit are particularly abundant, attracting predators like northern harrier, red-tailed hawk, Swainson's hawk, white-tailed kite, barn owl, and gopher snake. Among the gamebirds, mallard duck and pheasant forage and nest in this habitat, and several California quail were also seen by a Service biologist. Songbirds include the western meadowlark, which nests in the area, as well as Brewer's blackbird, yellow-billed magpie, western kingbird, and loggerhead shrike.

Riparian scrub-shrub occurs in close association with freshwater marsh in the project area. Many of the same avian and mammal species which occur primarily in freshwater marsh may be expected to derive some additional habitat benefit from riparian scrub-shrub. However, additional species of mammals, such as beaver, opossum, rabbit and mouse species occur in scrub-shrub. Beaver dams and recent damage to vegetation were noted just upstream of Raley Boulevard, on both Magpie and Don Julio Creeks. Also, a number of other avian species, such as ring-necked pheasant, mourning dove, California quail, white-crowned sparrow, western meadowlark, and kingfisher have been observed in this habitat during field visits.

In the freshwater emergent marsh, mallards and red-winged blackbirds nest at the marsh edge. Other bird species seen in this cover-type include the great egret, green-backed heron, great blue heron, black phoebe, pied-billed grebe, American coot, wood duck, black-crowned night-heron, belted kingfisher, marsh wren, and song sparrow. Muskrats forage on aquatic vegetation, and aquatic invertebrates such as freshwater clams, insect larvae, and crayfish. Amphibians, such as Pacific treefrog and bullfrog, and reptiles such as garter snakes are also present within the freshwater marsh. Mosquitofish are the only fish species we observed in the project area, although others have been reported from the creeks (EDAW 2002a). Other species may also be present in the perennial open water of the MCDRC near Robla Creek, where we once observed several very large fish.

Seasonal wetland supports a wide variety of water-associated wildlife when water is present, especially herons and ducks, and are also used by grassland small mammals when dry. Other wildlife found there include amphibians like the California slender salamander, western spadefoot toad, and Pacific treefrog, reptiles like the common garter snake, and aquatic invertebrates such as fairy shrimp and water beetles. These areas are frequented by small mammals such as the black-tailed jackrabbit and pocket gopher.

Open/poorly vegetated waters (primarily unvegetated lengths of the creeks) support aquatic invertebrates similar to those in the emergent marsh, but at lower densities. This reduction in forage organisms, as well as the general absence of cover results in much lower use of these areas by water-associated birds, mammals, reptiles, and amphibians. Nevertheless, the open waters do provide an important function as a migration corridor for water-associated species. Common fish species documented in a 1999 survey of Magpie and Don Julio Creeks included largemouth bass, bluegill, green sunfish, carp, goldfish, fathead minnow, and mosquitofish (EDAW 2002a). Fish were less abundant in the shallower, downstream portions of the creeks.

Endangered and Threatened Species - For all Federal projects, we recommend the Corps review its requirements, published in 50 CFR 402, for compliance with the Endangered Species Act. The Service has consultation responsibility for the federally listed species that may be affected by the project, and this office should be contacted regarding further consultation requirements. The Corps should request an updated list from the Service a list of all federally listed and proposed threatened and endangered species if an earlier list is more than 90 days old at the time preparation of any Biological Assessment for the project is undertaken. A current Sacramento County list is included in Appendix A. Previous lists are no longer valid due to the length of

time since the lists were issued, and the potential for additional observations and/or listings of species which may occur in the project area.

Surveys for special status species were conducted in 1993, 1994, and 1998 as part of the Project (ESA 1993, 1994b, EIP 1998 *in* EDAW 2002a), independently throughout MBP (CNC 1993), and in surrounding areas as part of other projects (Wymer 1987, cited *in* JSA 1989). Only the 203-acre former project area (current project area plus lands east to Patrol Road) was surveyed. No surveys were conducted in the historic Magpie Creek floodplain west of Raley Boulevard and southwest of the MCDC. These areas may harbor individuals of special status species which could be affected by the containment of floodflows by the Project, or development allowed by flood protection.

There were no candidate or listed species of mammals, reptiles, or amphibians documented in the surveys, although potential habitat is present for California tiger salamander (a candidate species), the western spadefoot toad and northwestern pond turtle (both candidate species), and giant garter snake (threatened). Earlier surveys also did not reveal giant garter snake in the project area (JSA 1989), but these, like later surveys, did not include the historic Magpie Creek floodplain.

The following are accounts of federally listed species which are known to be present, or habitat is present which may support their existence, in the project area:

vernal pool fairy shrimp, *Branchinecta lynchi* (threatened): These fairy shrimp inhabit ephemeral pools. Nearly all fairy shrimp feed on algae, bacteria, protozoa, rotifers, and bits of detritus. The females carry the eggs in an oval or elongate ventral brood sac. The eggs are either dropped to the bottom or remain attached until the female dies and sinks. The thick-shelled "resting" or "winter" eggs are capable of withstanding high heat, cold and prolonged desiccation. The eggs hatch when the vernal pools and swales fill with rainwater. The early stages of the fairy shrimp develop rapidly into adults.

vernal pool tadpole shrimp, *Lepidurus packardii* (endangered): Habitat for this species consists entirely of vernal pools. Food items include organic detritus and living organisms that they capture, such as fairy shrimp and other invertebrates. Like the vernal pool fairy shrimp, the tadpole shrimp passes the dry months in the egg stage, and hatches when the pools are filled with rainwater.

In the area between Don Julio and Magpie Creeks, comprising most of the preservation area, initial surveys in 1994 (ESA 1994b) showed that 5 pools contained the threatened vernal pool fairy shrimp, none contained tadpole shrimp, and 10 pools contained California *Lindieriella* (a category 3c candidate species). Subsequently, 1998 surveys also reported vernal pool fairy shrimp in several pools between Magpie and Don Julio Creeks (east of Raley Boulevard) and the threatened vernal pool tadpole shrimp in pools north of Magpie Creek (west of Raley Boulevard) (EIP 1998 *in* EDAW 2002a). The pools with listed species are not within the construction footprint of the project, although some pools in the preservation area would experience slight increases in flood depth and duration with the project, as discussed earlier. Either species may be

more widespread in wetter years, as suggested by comparison of the 1998 and 1994 surveys. The California Nature Conservancy delineation of wetlands on the MBP property (CNC 1993) did not include surveys for rare or endangered invertebrates, but did indicate that these were planned for 1994. If available, we recommend the Corps furnish this additional survey information on the Federal status invertebrates on the MBP property for our review.

giant garter snake, *Thamnophis gigas* (threatened): The giant garter snake inhabits sloughs, ponds, small lakes, low gradient streams and other waterways, such as irrigation and drainage canals. It feeds primarily on small fishes and frogs. During the snake's active season (early spring through mid-fall), habitat requisites consist of adequate water, and emergent, herbaceous wetland vegetation such as cattails and bulrushes, for foraging and escape from predators. During its winter dormancy period (November through April), the snake hibernates in small mammal burrows. The breeding season extends from March through April, and females give birth to live young from late July through early September. Clutch size is variable, ranging from 10 to 46 young. Urban expansion, flood control projects, and other human activities currently threaten the survival of the snake throughout its range.

Although giant garter snake has not been documented in the project area, there is sufficient habitat and local occurrence to indicate possible presence in the project area. It has been seen once ~2 miles northeast of the proposed project, on Robla Creek where it passes through MBP, and has been sighted frequently 1.5 miles west of the project, along the NEMDC. Perennial water is present in Don Julio and Magpie Creeks and certain sections of historic Magpie Creek, in association with seasonal and permanent wetlands, riparian cover and emergent marsh. These channels are bordered by a relatively continuous buffer of undisturbed upland vegetation. In recent years, the MCDC has also had perennial water. Numerous small mammals have been observed in these areas, indicating that their burrows, which are a habitat requisite for the giant garter snake, are also present in the area.

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (threatened): The valley elderberry longhorn beetle (VELB) is found only in association with its host plant, elderberry (*Sambucus* spp.), which the beetle requires to complete its life cycle. Larvae live in hollowed elderberry stems. Adults feed on elderberry foliage and perhaps flowers, and are present from March through early June. They mate in the spring, and females lay eggs on live elderberry plants. After a larvae transforms into an adult within the plant, the beetle chews an exit hole and emerges from the stem. Elderberry shrubs with VELB populations occur in a variety of habitats and plant communities, but most often in riparian or savannah areas.

Indirect evidence of VELB near the project is documentation of exit holes in the stem bases of two elderberry shrubs; these are located on MBP near Don Julio Creek, well outside of the probable construction and staging sites (ESA 1994b). In 1997 or 1998, these shrubs were severely impacted by an unauthorized channel clearing operation, however, several plants have resprouted from the roots, and additional elderberry shrubs were planted in the area.

Other Species: Among the plant species listed by the Service, neither Bogg's Lake hedgehyssop nor valley *Sagittaria* were documented in the project area. However, *Legenere* (a species

of concern) was documented in two vernal pools north of the MCDC near the confluence of Robla Creek.

Of those species with other status designations, the yellow warbler (a "Federal Sensitive Species," a designation used by the Bureau of Land Management and Forest Service) and loggerhead shrike (a Category 2 candidate species) were directly observed in the project area. The yellow warbler is known to utilize riparian woodlands, although ESA (1993) describe its potential habitat within the project area as "marginal." The loggerhead shrike is known to utilize open habitats with scattered perches, such as occur east of Raley Boulevard in the project area - although that area would be preserved. Several Swainson's hawks (State-listed as threatened, no Federal designation) were seen in courtship behavior over the northwest portion of the project area in 2000 (EDAW 2002a).

MITIGATION POLICY

The Service's Mitigation Policy as published in the Federal Register (46:15 January 23, 1981) defines mitigation as including the following elements, in order of preference: avoiding impacts, minimizing impacts; rectifying impacts; reducing impacts over time; and compensating for impacts. Under the Mitigation Policy, resources are assigned to one of four Resource Categories, each having a mitigation planning goal consistent with the fish and wildlife habitat values involved. The Resource Categories cover a range of habitat values from those considered to be unique and irreplaceable to those believed to be much more common and of relatively lesser value to fish and wildlife.

In applying the Mitigation Policy, each habitat or cover-type that may be impacted by the project is first identified. An evaluation species which utilize each cover-type is then chosen for Resource Category determination based on the following rationales: a) sensitivity to specific land and water use actions; b) importance in nutrient cycling or energy flow; c) utilization of a common environmental resource; or d) association with important resource problems, such as anadromous fish and migratory birds. Based on the importance of the cover-type to its selected evaluation species, and the cover-type's relative abundance, uniqueness, and replaceability, the appropriate Resource Category and associated mitigation planning goal is designated.

The four mitigation planning goals are: "no loss of existing habitat value" (Resource Category 1); "no net loss of in-kind habitat value" (Resource Category 2); "no net loss of habitat value while minimizing loss of in-kind habitat value" (Resource Category 3); and "minimize loss of habitat value" (Resource Category 4). "In-kind replacement" means providing or managing substitute resources to replace the habitat value of the resources lost, that are physically and biologically the same as or closely approximate those lost.

In addition to mitigation goals based on habitat values, Region 1 of the Service has a goal of "no net loss of wetlands *acreage* or habitat *values*, whichever is greater." We apply this goal to all proposed Federal and non-Federal activities in California that may affect a wetland. This goal applies to *all* of the wetland cover-types in the proposed project area and the impacted floodplain

(riparian scrub-shrub, open/poorly vegetated water, freshwater emergent marsh, seasonal wetland).

RESOURCE CATEGORIES AND EVALUATION SPECIES

The extent of riparian scrub-shrub cover within the City and County of Sacramento has been severely reduced due to agricultural and urban developments. Within the project area, diversion of water from historic Magpie Creek into the maintained MCDC has resulted in indirect impacts such as the grading of the historic Magpie Creek channel for pasture use in some sections, which supported scrub-shrub in the past. Extensive hardscaping has been performed on both Don Julio and Magpie Creek upstream of the proposed project, and on Robla Creek and portions of historic Magpie Creek downstream of the proposed project. Scrub-shrub persists only in limited patches within the MCDC, on Don Julio and Magpie Creeks east of Raley Boulevard, and portions of historic Magpie Creek which have not been recently subjected to periodic maintenance. Migratory songbirds are selected to represent the values of this cover-type, because of the importance of such habitat as a source of food, water, and cover for songbirds, and the abundant occurrence of songbirds where scrub-shrub is present. Because of the scarcity of riparian scrub-shrub habitat in the project area, we have designated it as Resource Category 2 (i.e., no net loss of in-kind habitat value).

For the same reasons discussed for riparian scrub-shrub, freshwater emergent marsh has also been severely reduced in the project area. As with scrub-shrub, emergent marsh is found only as fragments within historic Magpie Creek, the MCDC, and Don Julio and Magpie Creeks. These remnant areas are presently at risk of removal due to maintenance. Like other wetland types, the persistence of emergent marsh is dependent on a reliable source of water. Appropriate evaluation species for this cover-type are resident waterfowl such as the mallard. Emergent marsh is seasonally used by mallards for nesting, forage, and cover. We have designated emergent marsh in the project area as Resource Category 2 (i.e., no net loss of in-kind habitat value).

Upland/herbaceous grassland comprises the majority of the construction footprint of the project elements as well as most of preservation area, and has some current value to wildlife because the abundance of it in the project area supports a small mammal prey base for raptors and larger mammals. Small mammals, such as the California vole, are thus designated as the evaluation species for this cover-type. These uplands also form the sub-watersheds of seasonal wetlands. However, the value of these particular uplands is muted because of the predominance of non-native species such as star thistle and light urban development. Any need for upland buffers to seasonal wetlands would be considered under the mitigation recommendations for that cover-type. Because of its greater abundance locally and regionally, upland/herbaceous grassland in the project area is placed in Resource Category 4 (i.e., minimizing loss of habitat value).

Seasonal wetland occurs intermittently in the project area, mostly within the relatively undisturbed area east of Raley Boulevard between Magpie and Don Julio Creeks and, adjacent but outside the project area, about 150 acres on the northeastern portion of MBP in what were security and clearance zones around runways and other facilities of the former air force base. There are also several large, hardpan vernal pools both north and south of the MCDC (just east of

Robla Creek) and in the historic Magpie Creek floodplain (west of terminus of Main Avenue). Though formerly abundant in the Central Valley of California, this cover-type has been severely reduced through agricultural practices and urban developments. When inundated, seasonal wetland provides many of the same wildlife values as emergent marsh for waterfowl, such as cover and forage. During the dry season, this cover-type supports grassland mammals such as voles and rabbits. Some rare plants and invertebrates adapted to seasonal wetland hydrology are found only in this cover-type. Resident waterfowl such as the mallard would be an appropriate evaluation species for this cover-type. We have designated seasonal wetland as Resource Category 2 (i.e., no net loss of in-kind habitat value).

Open/poorly vegetated waters occur throughout the project length, in those unvegetated sections of the MCD, Don Julio Creek, and Magpie Creek not designated as scrub-shrub or emergent marsh. Open water is considered a type of wetland which functions as a movement corridor between the vegetated areas of the channels, and between larger blocks of habitat within MBP to the east, and within the NEMDC to the west. Therefore, an appropriate evaluation species would be resident waterfowl such as the mallard, and wading birds such as egrets. These species have been observed foraging in open waters of the project area, although invertebrate production is likely reduced relative to freshwater emergent marsh. Though more abundant than the vegetated wetland cover-types, open water is very scarce in the project area. Due to its local scarcity and importance as a migration corridor in the Project area, we have designated open water as Resource Category 2 (i.e., no net loss of in-kind habitat value).

HABITAT ANALYSIS

Traditionally, the Service uses HEP to verify that habitat values with a project and its mitigation are at least equal to without project conditions. We judged that a HEP analysis was not warranted for the current design of the project owing to the extremely limited areas of impact, the indirect nature of the impact, the temporary or infrequent nature of the impact, and/or a low likelihood that the impact would measurably affect habitat value. We conducted a limited quantitative analysis by determining the impact areas of the project elements. Below, we report the areas affected, discuss each potential impact, the frequency of occurrence, and the consequences of the action from a habitat perspective. We reviewed and compared notes and photographs from numerous field visits throughout the project area and affected floodplain, most recently on January 5 and March 31, 2000, and March 31 and April 1, 2003.

GENERAL FUTURE ASSUMPTIONS

Because a formal HEP was not conducted, it was not necessary to formulate detailed quantitative assumptions regarding impacts and futures as was done previously (FWS 1996a, 2001). The following are general assumptions used in developing the future with- and without-project descriptions:

1. *Period of Analysis:* Construction is assumed to begin and end in one season. The project life would be 50 years, so the period of analysis would be 51 years.

2. *Maintenance*: For both with- and without-project conditions, we assume that present conditions represent the average condition of the channels throughout the period of analysis. Maintenance of the levees, done by the American River Flood Control District, consists of mowing several times a year, pre-emergent herbicide application in spring, and maintenance road gravel replenishment on an as-needed basis. The Department of Water Resources maintains the channel between Raley and Rio Linda Boulevards, including most of the project area. Sacramento Maintenance Yard clearing surveys indicate hand labor is done every 4 or 5 years in this area (Linda Creek area) to clear necessary debris from the channel bottom and the woody vegetation off the banks. Such maintenance is consistent with the observed condition of the channel. Since the revised project proposes no modifications, it is appropriate to apply the current condition to the future condition. We further assume that some maintenance of the channel leading to the bike trail culvert will be done, although this is not specified in EDAW (2002a).

3. *Culvert impacts*: The planned alignment of the culvert falls within the trunks and/or driplines of up to eight trees (six oaks, two locusts). It is uncertain of the extent of impact would be avoided. At most, eight trees would be lost.

4. *Hydraulic impacts*: Although EDAW (2002a) states a maximum 0.1-0.5 foot increase in water level in the preservation area for the 170-year event, durations are not specified, nor are increases in water level for higher frequency (smaller) events. By extrapolating the trend of the stage hydrograph upstream of Raley Boulevard (Figure 7 in Ford 2001) to 12 hours, we estimate the additional duration of flooding due to the project to be no more than 2 hours. Noting that the cumulative runoff of flow entering historic Magpie Creek through outflanking/overtopping declines from 1,163 cfs at the 200-year event (Table 4 in Ford 2001), to 121 cfs at the 2-year event, we assume that the project-induced increase in water level at higher frequency events decreases by about the same magnitude (i.e., to 0.01-0.05 feet at the 2-year event)

5. *Earthwork location*: We assume that the work for levee raising would be done entirely on the top and land side of the levee. The only work on the water side of levees is assumed to be for the channel and culvert near the Robla Creek bike trail overcrossing.

6. *Land Use Planning*: It is assumed that provisions of the General Plan, including current zoning designations and the North Sacramento Community Plan Amendment: Magpie Creek Goals and Policies (reference number M92-071) would remain in their present form for the life of the project and be enforced.

FUTURE WITHOUT THE PROJECT

The future without the project would resemble baseline conditions during the early project life. Maintenance would be irregularly conducted in the MCDC and both creeks, limiting the extent of riparian development to near existing conditions. The portion of the project, and associated wetland and riparian scrub habitats, that would have been in the preservation area would remain at risk of development, as these areas are zoned for light industry. The riparian scrub-shrub might be retained in some fashion, as the channel is needed for drainage - or - it could be lost due to channelization and lining with concrete to maximize development potential. The bulk of the

seasonal floodplain/overbanking wetlands would be at risk of loss to development, especially those just east of Raley Boulevard. To the west of Raley Boulevard, Don Julio Creek might be realigned or contained in a closed culvert. If the lands are not developed, the seasonal wetlands would likely remain similar to present conditions. Elsewhere in the project, the eight trees in the culvert alignment would remain, as none are in a foreseeable development area.

In the project floodplain (historic Magpie Creek), development might be somewhat hindered by either additional costs (i.e., of flood insurance or pad construction) or the availability of alternative lands without such encumbrances. However, the moderate depth of flooding due to outflanking/overtopping is not so extreme as to preclude development entirely. Comparison of existing conditions to 1993 habitat maps show that vernal pool losses have occurred in the historic Magpie Creek floodplain in small developments such as Robla Community Park (Burgess and Bell Streets, North Norwood) and Applegate Trucking (Raley Boulevard and Vinci Street); both were compensated by purchase of mitigation bank credits. The largest remaining parcel with seasonal wetlands, near Sunset Lawn Cemetery, is also within the floodplain. Certain recent and foreseeable small development actions such as recreational grounds or cemetery expansion, could occur with or without additional flood control.

While habitat west of Raley Boulevard is fragmented and of moderate value to wildlife, the area to the east is of greater value and unit size. Thus, any development to the east could substantially reduce habitat value and use by wildlife - particularly waterfowl, as well as reduce buffer zones between such development and hardpan vernal pools known to support listed species. The overall unit size of the wetland/upland complex could decrease significantly, as the 79 acres in question is significant in comparison with the ~200 acres overall (within and outside MBP). The potential of such development is not currently high, however, because these lands are somewhat more low-lying than surrounding parcels, requiring more substantial earth pad construction.

Lands which remain undeveloped within the project area would be occasionally disturbed by tilling for firebreaks or levee and channel maintenance activities, similar to existing conditions.

FUTURE WITH THE PROJECT

Initially, there would be some disturbance of wildlife use during project construction due to noise and vibration of heavy machinery. Since work is entirely to the land side of the channel, there would be no loss of vegetation within the channel. After work is completed, habitat conditions in the MCDC from Raley Boulevard to Robla Creek would be very much the same as without project conditions. About 2.6 acres of upland would be disturbed due to construction of the outflanking levee, maintenance road, culvert, and levee raising elements. All except the maintenance road (1.4 acres) would return to its existing state of upland/herbaceous cover within 1 year of completion; the top of levee and land side maintenance roads would be kept as a dirt or graveled surface. The culvert channel may receive some additional mowing or clearing, however the area is very limited (0.2 acre). We estimate as many as 6 oak trees, and 2 black locusts, could at least be impacted by construction within their driplines, or removed as a result of the culvert construction. Cutting of tree roots could occur, permanently reducing plant health and survival.

Development within the floodplain areas along historic Magpie Creek and the MCDC (Figure 2) west of Raley Boulevard may be slightly induced, owing to the reduced depth of flooding, however, these same areas would still receive the same level of interior drainage for events smaller than the levee overtopping 14-year overtopping frequency. Portions of the historic Magpie Creek floodplain which possess seasonal wetland/upland/vernal pool complex values may be lost due to slightly more rapid development than would occur without the project.

The section of historic Magpie Creek west of Raley Boulevard was considered by the City of Sacramento in its 1993 adoption of a resolution ("North Sacramento Community Plan Amendment: Magpie Creek Goals and Policies," reference number M92-071). It is located roughly along the alignment of the floodplain in Figure 2. The City resolved that after the flood control project under consideration in this report is completed, sections of the channel that were either concrete-lined or cleared of vegetation should be restored to a more natural state (the extent dependent on interior drainage needs), and the right-of-way for habitat should be a minimum of 50 feet on each side of the creek centerline. Although we assume and recommend that this plan be enforced, such plans may undergo revision, or could be limited in application in portions where urban encroachment has already occurred adjacent to the concrete-lined section.

The preservation area would be affected most significantly by eliminating any potential for future development of these parcels, and by providing further opportunities for habitat enhancement. With purchase, we project no net loss of habitat value over the life of the project, nor any adverse change in wetland character or habitat value due to the hydraulic effect noted above (*see* General Assumption 4). Rather, it is possible if not more likely that the area would be enhanced through efforts such as: a) replanting barren areas of Don Julio or Magpie creeks; b) realignment and restoration of Don Julio Creek west of Raley Boulevard; c) beaver management; and/or d) star thistle management. These improvements might be accomplished as mitigation actions for small projects or as unrelated enhancement measures on open spaces.

DISCUSSION

As currently proposed, the project would increase flood protection with minimal impact, primarily the loss of a few acres of frequently-disturbed grassland, and impacts to eight or fewer trees. The purchased preservation area provides considerable protection of wetland and riparian habitats (including vernal pools), which are exceedingly rare and rapidly disappearing from North Sacramento County. As it concerns the conversion of upland/grassland, we do not recommend mitigation for this cover-type.

The potential damage to mature oak trees does warrant consideration of design measures to maximize avoidance and mitigate any unavoidable tree loss. As many as eight trees (eight oaks, two black locusts) appear to be in or very near the current alignment of the culvert channel. These oaks are mature, 18-24 inches diameter at breast height, and on the order of 100 years old or more. It is important to note that the design does not show locations of existing trees, so it is not possible to specify exact losses. In our evaluation of the site, there are at least four options to further avoid tree losses (in order of decreasing Service preference): a) replace the bike bridge (former railroad bridge) with a wider span on both sides - by widening on both sides, we believe

that all oaks could be avoided; b) replace the bridge with widening only on the right bank - this would result in a loss of as little as one mature oak; c) relocate the section of the culvert channel west of the bike trail so that it is parallel and adjacent to the trail berm (rather than 50 feet downstream) - this would avoid at least one oak that appears to be in the current construction alignment; or d) "weave" the culvert channel around or between as many mature oaks as possible - this could avoid three to five oaks. We recommend the first, and simplest approach - *in lieu* of a culvert, replace the bridge with a wider span on both sides.

For unavoidable impacts to oaks through construction in the dripline (but without loss of the trees), we recommend mitigation at a replanting ratio of 5:1. For each tree removed, we recommend a replanting ratio of 15:1 per tree. For either of the black locusts, we recommend a 3:1 mitigation ratio per tree, imposed only if the trees are removed (none requested for dripline impact). Potential mitigation locations might include lands with sparse or no trees along Don Julio Creek, historic Magpie Creek, elsewhere on the bike trail, or another area(s) mutually acceptable to the Service, Corps, and local sponsor.

The project area has experienced habitat losses due to both planned projects and unregulated activities. Recent impacts include: a) 2002 - 4.5 acres of wetland impacted by the Lower Dry Creek and Robla Creek Levee Improvements Mitigation Project (Public Notice 20000054) just completed - that realigned Robla Creek into an overexcavated borrow area which is designated for habitat enhancement (borrow which was used for levee construction); b) 1999 - 1.5 acres of wetland impacted by construction of Robla Community Park; c) 1997-98 - unauthorized damage of several elderberry bushes occupied by the listed VELB; d) 1998 <1 acre of seasonal wetland/swale loss on the current site of Applegate Trucking, along Raley Boulevard; e) 1994 - construction of water and sewer mains through the currently-proposed preservation area - losses unknown; f) 2002 - loss of two cottonwoods and/or oaks along Don Julio Creek, just west of Raley Boulevard, cause unknown; g) 2000 - beaver damage to two-four cottonwoods and willows just east of Raley, along Don Julio Creek; and h) 1995-1997 - loss of seasonal wetlands/vernal pools west of Dry Creek Road just north of the MCDC, <1 acre, cause unknown. Although some losses (a-d) were mitigated, the others were not. Small individual losses are especially difficult to document and regulate, particularly in light of the emphasis of public agencies on large projects with much larger impacts. Nevertheless, they can together result in a larger and significant cumulative loss.

In light of this situation, we previously recommended and received a delineation of wetlands in the historic Magpie Creek floodplain, and further recommended that the results of the delineation and other regulatory information be distributed with the community plan amendment discussed previously (FWS 2001). The delineation was limited to areas within 100 feet of the creek and, while it did not quantify the seasonal wetland/swale complex near Sunset Lawn Cemetery, the authors acknowledge its presence and speculate that the raised bike trail may contribute to seasonal flooding from the creek and/or a shallow water table (Kimball 2001). Although we do not consider the delineation comprehensive, we are not requesting work at this time because of difficulty in obtaining landowner permission to conduct further surveys. To promote public awareness and minimize unauthorized loss, we repeat our earlier recommendation that the delineation results, Community Plan Amendment discussed earlier, and permitting procedures be distributed to landowners in the historic Magpie Creek floodplain.

In conclusion, we find the proposed project to be largely acceptable and consistent with Service policies to maximize avoidance of impacts. It includes a substantial preservation component, as well as a mitigation commitment for indirect impacts to vernal pools that is consistent with Service guidance (FWS 1996b). The project has very limited, mostly temporary impacts on relatively common grassland habitat. Our only recommendation for modification is to consider options to the bike trail culvert design to maximize avoidance of mature oak trees.

RECOMMENDATIONS

We recommend the Corps and local sponsor consider the following measures for fish and wildlife resources in the project area:

1. *Revegetation of Don Julio/Magpie Creek (east of Raley Boulevard)* - The creeks in the preservation area have sections with very limited woody vegetation. Portions of Don Julio Creek near the MBP fence boundary have much thicker willow scrub, suggesting that the downstream areas could support additional vegetation. Some significant trees have been recently lost due to unknown factors, possibly beaver damage or maintenance. We recommend a modest replanting program of additional trees and shrubs at the top of bank of the creeks. The palette of species should include xeric species such as oaks (see below) and elderberries, as well as hydric species like willow, cottonwood, or box elder. The density and distribution of trees should be such that they would establish with minimal or no initial irrigation, require no long term irrigation, and their planting would not adversely affect seasonal wetlands.
2. *Avoidance of direct impacts* - Redesign the bike trail culvert to maximally avoid oak trees; in order of decreasing preference, we recommend: a) replacing the bridge with a wider span *in lieu* of the culvert, widening on both sides; b) replacing the bridge with a wider span *in lieu* of the culvert, widening on one side (north bank); c) positioning the culvert outlet adjacent and parallel to the bike trail; or d) weaving the culvert between oak trees.
3. *Mitigation for unavoidable direct/indirect effects to oak trees* - we recommend that a 5:1 mitigation ratio be applied to oak trees that are indirectly affected by construction of the bike bridge culvert within driplines (but not removed), a 3:1 mitigation ration for removal of either black locust tree, and a 15:1 mitigation ration be applied to removed oak trees. Potential locations for replanting include the preservation area (in conjunction with recommendation #1), historic Magpie Creek, other portions of the bike trail with gaps, or any other location in Sacramento County acceptable to the Corps, local sponsor, and Service.
4. *Restoration of historic Magpie Creek* - Historic Magpie Creek just west of Raley Boulevard lacks a distinct channel, although it is evident a short distance east of Dry Creek Road. We recommend the local sponsor and Corps consider some initial work for this most degraded section of the historic creek, including: a) re-establishing a low-flow outlet from the MCDC to the historic creek; and b) reconstructing the channel for sections that are now leveled or filled. These actions should be consistent with the North Sacramento Community Plan Amendment: Magpie Creek Goals and Policies, reference number M92-071, but are recommended to be implemented in advance of that which would be required by the amendment. We encourage the

re-establishment of a mix of native xeric species such as oaks and elderberries, that are largely absent from this drainage, others like cottonwood, willow or box elder, and reseedling with native grasses and forbs.

5. *Enhancement of preservation area* - In addition to tree replanting noted in recommendation #1 (which may be either mitigation of tree losses or enhancement), we recommend consideration of the following enhancement measures although with careful attention not to impact existing seasonal wetland values: a) management of star thistle - possibly in conjunction with reseedling with native grasses and forbs; b) beaver control - reducing or eliminating beaver damage through trapping and relocation; c) realignment of Don Julio Creek west of Raley Boulevard to a more east-west alignment away from Raley, and revegetation of this creek segment.

6. After construction of the project, reseed all disturbed areas with native grasses and forbs.

7. To facilitate the preservation and/or mitigation of wetlands from future development within the floodplain west of Raley Boulevard:

a) implement the North Sacramento Community Plan Amendment: Magpie Creek Goals and Policies, reference number M92-071;

b) distribute the results of the wetland delineation, community plan amendment, and information on current Corps permitting procedures, to landowners.

8. Complete Endangered Species Act section 7 consultation with the Service, and provide all available surveys of listed species to the Service.

9. Erect temporary fencing at construction boundaries adjacent to sensitive habitat (creek or diversion channels, near seasonal wetland swales/pools, etc.).

10. Provide information on maintenance activities which would occur with the project, compared to without-project conditions for existing, and new facilities (i.e., new box culvert).

11. Provide information on foreseeable upstream flood control facilities and/or development actions within McClellan Business Park (former air force base).

12. Provide a map of existing trees in the vicinity of the proposed bike trail culvert.

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APPENDIX A: APRIL 23, 2003 LIST OF ENDANGERED AND THREATENED SPECIES
THAT MAY OCCUR IN OR BE AFFECTED BY PROJECTS IN SACRAMENTO COUNTY

ATTACHMENT A
Endangered and Threatened Species that May Occur in or be Affected by
PROJECTS IN SACRAMENTO COUNTY

Reference File No. 1-1--

April 23, 2003

Listed Species

Mammals

riparian (San Joaquin Valley) woodrat, *Neotoma fuscipes riparia* (E) *

Birds

bald eagle, *Haliaeetus leucocephalus* (T)

Reptiles

giant garter snake, *Thamnophis gigas* (T)

Amphibians

California tiger salamander, *Ambystoma californiense* (C/E)

California red-legged frog, *Rana aurora draytonii* (T)

Fish

Critical habitat, winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

winter-run chinook salmon, *Oncorhynchus tshawytscha* (E) NMFS

Critical habitat, delta smelt, *Hypomesus transpacificus* (T)

delta smelt, *Hypomesus transpacificus* (T)

Central Valley steelhead, *Oncorhynchus mykiss* (T) NMFS

Central Valley spring-run chinook salmon, *Oncorhynchus tshawytscha* (T) NMFS

Sacramento splittail, *Pogonichthys macrolepidotus* (T)

Invertebrates

Conservancy fairy shrimp, *Branchinecta conservatio* (E)

vernal pool tadpole shrimp, *Lepidurus packardii* (E)

vernal pool fairy shrimp, *Branchinecta lynchi* (T)

Critical habitat, valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

valley elderberry longhorn beetle, *Desmocerus californicus dimorphus* (T)

delta green ground beetle, *Elaphrus viridis* (T)

Plants

Antioch Dunes evening-primrose, *Oenothera deltoides* ssp. *howellii* (E)

Sacramento Orcutt grass, *Orcuttia viscida* (E)

slender Orcutt grass, *Orcuttia tenuis* (T)

soft bird's-beak, *Cordylanthus mollis ssp. mollis* (E) *

Proposed Species

Birds

mountain plover, *Charadrius montanus* (PT)

Invertebrates

Critical habitat, vernal pool invertebrates, *See Federal Register 67:59883* (PX)

Plants

Critical habitat, vernal pool plants, *See Federal Register 67:59883* (PX)

Candidate Species

Birds

Western yellow-billed cuckoo, *Coccyzus americanus occidentalis* (C)

Fish

green sturgeon, *Acipenser medirostris* (C)

Central Valley fall/late fall-run chinook salmon, *Oncorhynchus tshawytscha* (C) NMFS

Critical habitat, Central Valley fall/late fall-run chinook, *Oncorhynchus tshawytscha* (C) NMFS

Species of Concern

Mammals

pale Townsend's big-eared bat, *Corynorhinus (=Plecotus) townsendii pallescens* (SC)

Pacific western big-eared bat, *Corynorhinus (=Plecotus) townsendii townsendii* (SC)

greater western mastiff-bat, *Eumops perotis californicus* (SC)

small-footed myotis bat, *Myotis ciliolabrum* (SC)

long-eared myotis bat, *Myotis evotis* (SC)

fringed myotis bat, *Myotis thysanodes* (SC)

long-legged myotis bat, *Myotis volans* (SC)

Yuma myotis bat, *Myotis yumanensis* (SC)

San Francisco dusky-footed woodrat, *Neotoma fuscipes annectens* (SC)

San Joaquin pocket mouse, *Perognathus inornatus* (SC)

Birds

Swainson's hawk, *Buteo Swainsoni* (CA)
little willow flycatcher, *Empidonax traillii brewsteri* (CA)
greater sandhill crane, *Grus canadensis tabida* (CA)
black rail, *Laterallus jamaicensis coturniculus* (CA)
bank swallow, *Riparia riparia* (CA)
Aleutian Canada goose, *Branta canadensis leucopareia* (D)
American peregrine falcon, *Falco peregrinus anatum* (D)
tricolored blackbird, *Agelaius tricolor* (SC)
western burrowing owl, *Athene cunicularia hypugaea* (SC)
American bittern, *Botaurus lentiginosus* (SC)
ferruginous hawk, *Buteo regalis* (SC)
Lawrence's goldfinch, *Carduelis lawrencei* (SC)
white-tailed (=black shouldered) kite, *Elanus leucurus* (SC)
loggerhead shrike, *Lanius ludovicianus* (SC)
marbled godwit, *Limosa fedoa* (SC)
Lewis' woodpecker, *Melanerpes lewis* (SC)
long-billed curlew, *Numenius americanus* (SC)
white-faced ibis, *Plegadis chihi* (SC)
rufous hummingbird, *Selasphorus rufus* (SC)
red-breasted sapsucker, *Sphyrapicus ruber* (SC)
California thrasher, *Toxostoma redivivum* (SC)
oak titmouse, *Baeolophus inornatus* (SLC)
Nuttall's woodpecker, *Picoides nuttallii* (SLC)

Reptiles

silvery legless lizard, *Anniella pulchra pulchra* (SC)
northwestern pond turtle, *Clemmys marmorata marmorata* (SC)
southwestern pond turtle, *Clemmys marmorata pallida* (SC)

California horned lizard, *Phrynosoma coronatum frontale* (SC)

Amphibians

foothill yellow-legged frog, *Rana boylei* (SC)

western spadefoot toad, *Spea hammondi* (SC)

Fish

river lamprey, *Lampetra ayresi* (SC)

Kern brook lamprey, *Lampetra hubbsi* (SC)

Pacific lamprey, *Lampetra tridentata* (SC)

longfin smelt, *Spirinchus thaleichthys* (SC)

Invertebrates

Antioch Dunes anthicid beetle, *Anthicus antiochensis* (SC)

Sacramento anthicid beetle, *Anthicus sacramento* (SC)

Midvalley fairy shrimp, *Branchinecta mesoamericana* (SC)

San Joaquin dune beetle, *Coelus gracilis* (SC)

curved-foot hygrotus diving beetle, *Hygrotus curvipes* (SC)

California linderiella fairy shrimp, *Linderiella occidentalis* (SC)

Plants

Boggs Lake hedge-hyssop, *Gratiola heterosepala* (CA)

Suisun Marsh aster, *Aster lentus* (SC)

San Joaquin spearscale (=saltbush), *Atriplex joaquiniana* (SC)

Tuolumne coyote-thistle (=button-celery), *Eryngium pinnatisectum* (SC)

Ahart's (dwarf) rush, *Juncus leiospermus* var. *ahartii* (SC)

Red Bluff (dwarf) rush, *Juncus leiospermus* var. *leiospermus* (SC)

delta tule-pea, *Lathyrus jepsonii* var. *jepsonii* (SC)

legenere, *Legenere limosa* (SC)

Mason's lilaeopsis, *Lilaeopsis masonii* (SC)

pincushion navarretia, *Navarretia myersii* spp. *myersii* (SC)

valley sagittaria (=Sanford's arrowhead), *Sagittaria sanfordii* (SC)

stinkbells, *Fritillaria agrestis* (SLC)

Amador (Bisbee Peak) rush-rose, *Helianthemum suffrutescens* (SLC)

Northern California black walnut, *Juglans californica* var. *hindsii* (SC) *

KEY:

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|-------|--------------------------------------|---|
| (E) | <i>Endangered</i> | Listed (in the Federal Register) as being in danger of extinction. |
| (T) | <i>Threatened</i> | Listed as likely to become endangered within the foreseeable future. |
| (P) | <i>Proposed</i> | Officially proposed (in the Federal Register) for listing as endangered or threatened. |
| (PX) | <i>Proposed Critical Habitat</i> | Proposed as an area essential to the conservation of the species. |
| (C) | <i>Candidate</i> | Candidate to become a <i>proposed</i> species. |
| (SC) | <i>Species of Concern</i> | Other species of concern to the Service. |
| (SLC) | <i>Species of Local Concern</i> | Species of local or regional concern or conservation significance. |
| (D) | <i>Delisted</i> | Delisted. Status to be monitored for 5 years. |
| (CA) | <i>State-Listed</i> | Listed as threatened or endangered by the State of California. |
| NMFS | NMFS species | Under the jurisdiction of the National Marine Fisheries Service. Contact them directly. |
| * | <i>Extirpated</i> | Possibly extirpated from the area. |
| ** | <i>Extinct</i> | Possibly extinct |
| | <i>Critical Habitat</i> | Area essential to the conservation of a species. |